

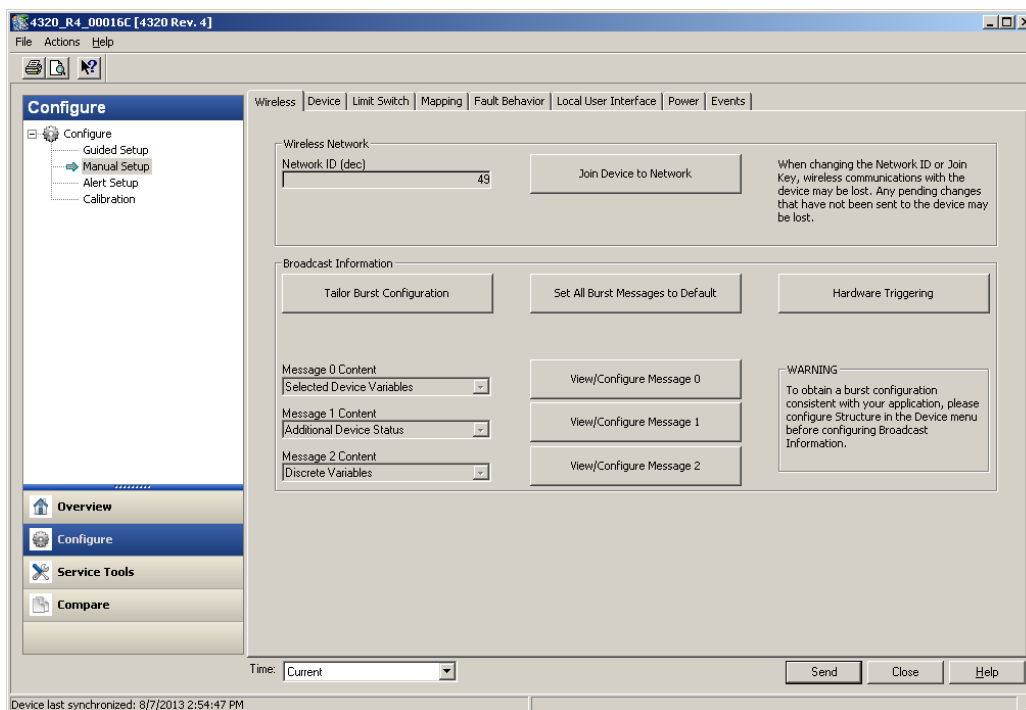
4310/4320 Wireless Position Monitor Burst Configuration and Diagnostics

This document applies to:

| | |
|-------------------|--|
| Fisher® 4320 | Device Type 1308 (hex) 4872 (decimal) |
| TopWorx™ 4310 | Device Type E0CE (hex) 57550 (decimal) |
| Device Revision | 4 |
| Firmware Revision | 5 |
| DD Revision | 1 |

This document will guide you through burst configuration and diagnostics using AMS Device Manager. Burst can be configured similarly using the 475 Field Communicator. Refer to the appropriate instruction manual [D103622X012 (4310) or D103621X012 (4320)], available from your Emerson Process Management sales office, or www.Fisher.com, for the Field Communicator menu trees, as well as 4310/4320 wireless position monitor installation, setup and maintenance information.

Access burst configuration in the *Broadcast Information* group from the *Wireless* tab in *Configure, Manual Setup*.



When connected at the maintenance port, this screen shows the Network ID and the Basic content assignment for each burst message. When AMS is communicating with the device over the wireless network, these variables are not



displayed to help the screen load a little faster. Select the *View/Configure Message 0, 1, or 2* buttons to see the complete burst configuration for that message.

For each *Burst Message* the following menu items are displayed: *Enabled/Disabled*, *Message Content*, *Content Details* (this group bears the label of the selection in Message Content), *Trigger Mode*, and *Trigger Parameters*. For an explanation of any of the parameters, position the cursor in the value box for the parameter and press the F1 (HELP) key.

View/Configure Burst Message

This menu is read-only. Use the *Modify* button to make changes to these settings. Select Accept or Cancel to exit the procedure.

Burst Message 0

Burst Message 0

Enabled/Disabled
Enabled

Message Content
Selected Device Variables

Selected Device Variables

Burst Trigger Variable
Switch States

Burst Variable 2
Set Point

Burst Variable 3
Supply Voltage

Burst Variable 4
Loop Current

Burst Variable 5
Cycle Counter

Burst Variable 6
Last Open Stroke Time

Burst Variable 7
Last Close Stroke Time

Burst Variable 8
Temperature

Trigger Mode
Windowed

Trigger Parameters

Burst Trigger Level
0.0

Trigger Units
None

Triggered Update Rate
8.0 seconds

Default Update Rate
60.0 seconds

Delayed Triggering
Disabled

Sensor Sample Rate
8.0 seconds

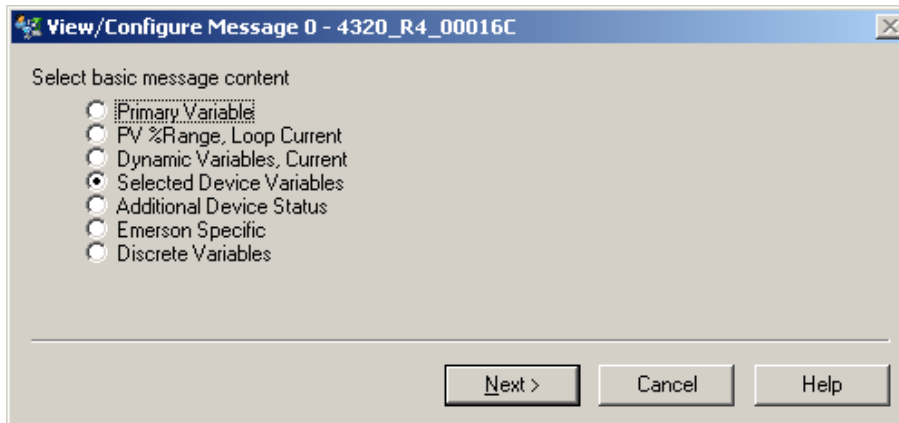
NOTE: If you have trouble with the persistence of edited values inside this procedure, the host may have two active connections to the device (Wireless Network and HART modem). Temporarily disable one of the interfaces to complete the configuration.

Accept Modify Cancel Help

After clicking *Modify*, you are guided through the burst configuration process. If you only want to adjust one or two parameters, accept the existing settings for the parameters you don't need to change as you page through the procedure.

Message Content

The first choice presented is the basic *Message Content*.



Choose between:

- Primary Variable (command 1)
- PV %Range, Loop Current (command 2)
- Dynamic Variables, Current (command 3)
- Selected Device Variables (command 9)
- Additional Device Status (command 48)
- Emerson Specific (command 178 - Dynamic Variables and Additional Status)
- Discrete Variables (command 64386)

The normal or typical setting is “Selected Device Variables”.

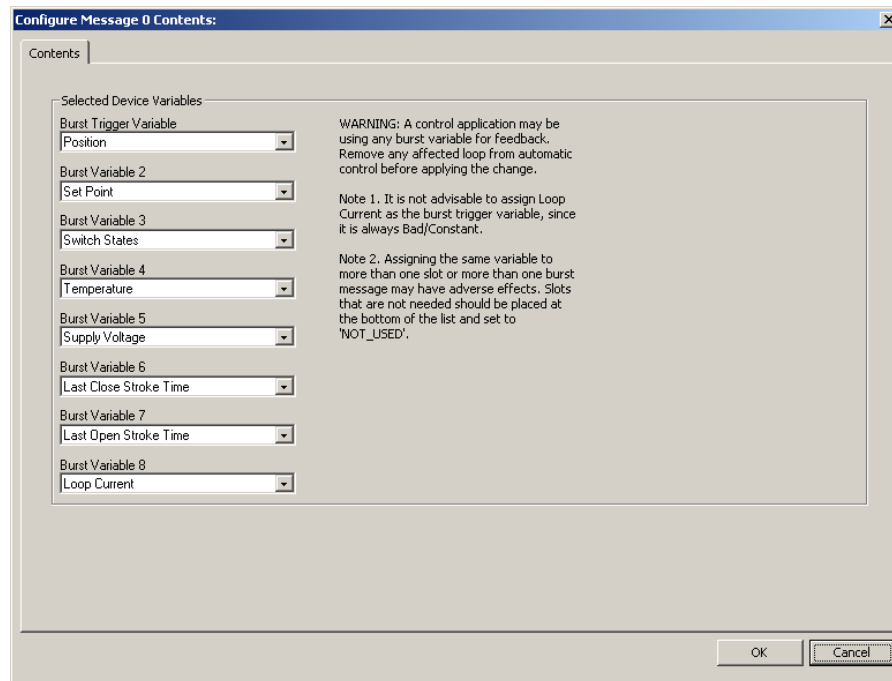
Contents

Three of the Message Content choices allow you to adjust the fine detail of the burst message contents. Assign basic content to the messages based on your application requirements:

- If the device is a monitor and you only need to track one parameter, you may be able to use only one message bursting the *Primary Variable*.
- If you need to track only 2 or 3 variables and the alerts, you could enable 2 messages and assign *Dynamic Variables and Current* to one and *Additional Device Status* to the other.
- If you are using an Emerson Gateway that configuration can be reduced to a single active message bursting the *Emerson Specific* content.
- If you have a lot of parameters to track, *Selected Device Variables* will probably be used for at least one message.
- If you are using many parameters but need some at a faster rate than others, you could assign *Selected Device Variables* as the basic content of two different messages, assign the fast update variables to one of them and the slow variables to the other, and schedule their publication accordingly.
- For On/Off control devices, you must publish *Discrete Variables* in one of the messages.

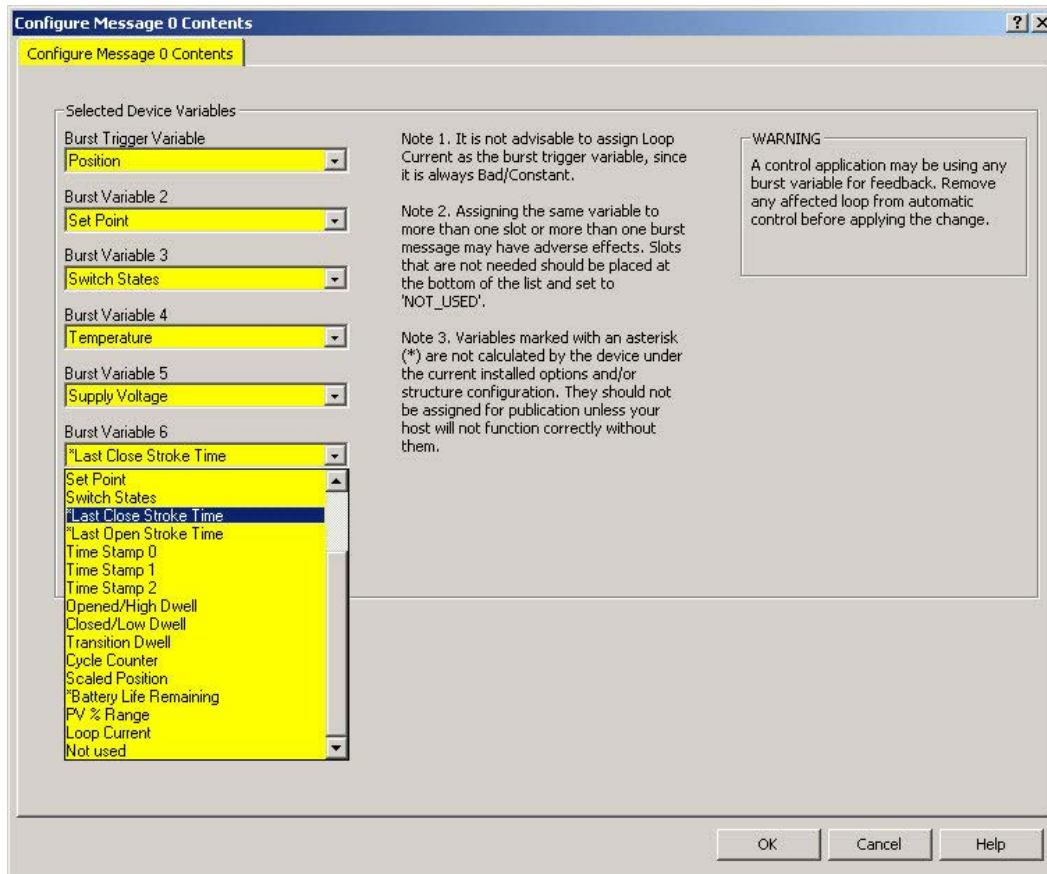
Selected Device Variables (Command 9) is one of the choices that allow detailed content adjustment:

SELECTED DEVICE VARIABLES IS THE NORMAL OR TYPICAL SETTING FOR AN ON/OFF CONTROL APPLICATION

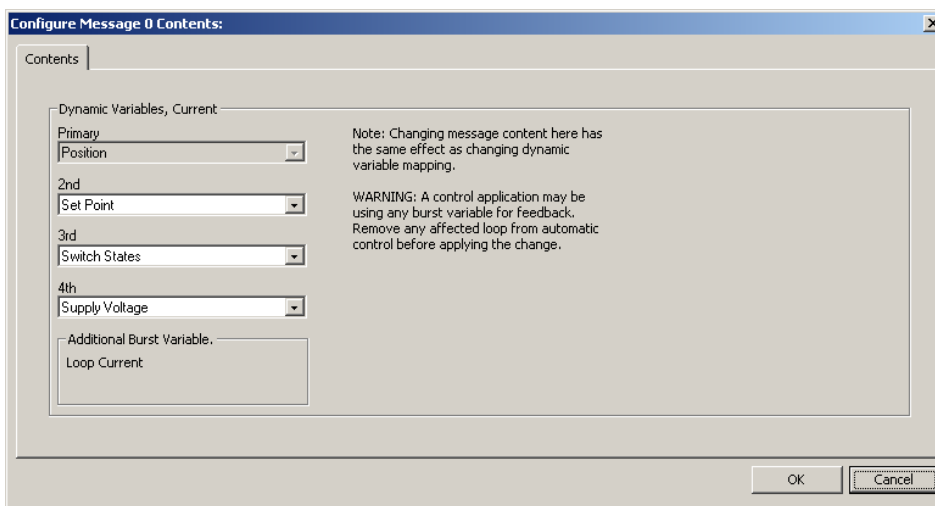


You may assign the desired device variables to individual slots in the message. The variable placed in the first slot becomes the *Trigger Variable* when burst trigger modes other than *Continuous* or *On-Change* are selected, so it is advisable that the variable in that slot be chosen carefully. Using a variable that never changes, like Loop Current, or one that dithers, such as Temperature, might be a poor choice for certain trigger modes. Usually the *Trigger Variable* should be the parameter whose change is most representative of the process state you are monitoring.

Some of the available device variables are not computed in the device in a given structure or operating mode. These are marked with an asterisk in the drop-down list that appears when you edit a slot.



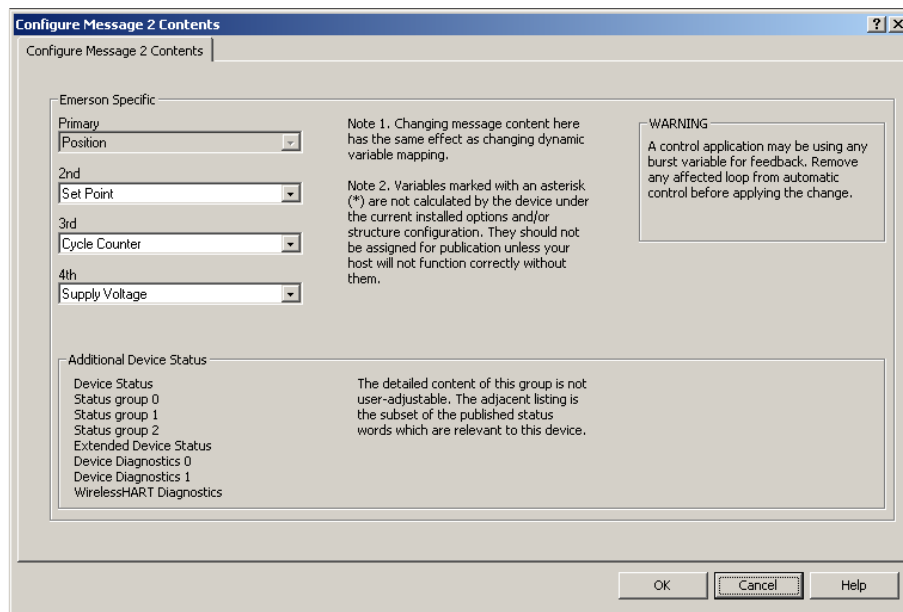
Dynamic Variables and Current (Command 3) is the second choice that allows detailed adjustment:



Here you can edit the 2nd, 3rd, and 4th *Dynamic Variable* slots. The *Primary Variable* is fixed. *Loop Current* is also published in this command, although it is always Not a Number, Bad, and Constant in the wireless device. The *Loop Current* value is sometimes needed by control system hosts, such as a DeltaV™ system.

Make certain that any information that the host needs from the device is being published by the device in a timely manner. If data is not being published, it is not available in the Gateway cache and the network manager application will have to send a special request to the device to obtain that data every time a host requests it. This behavior uses up a lot of the available bandwidth, and the network can become clogged if too many devices have data that is not being published.

Emerson Specific (Command 178) is the third:



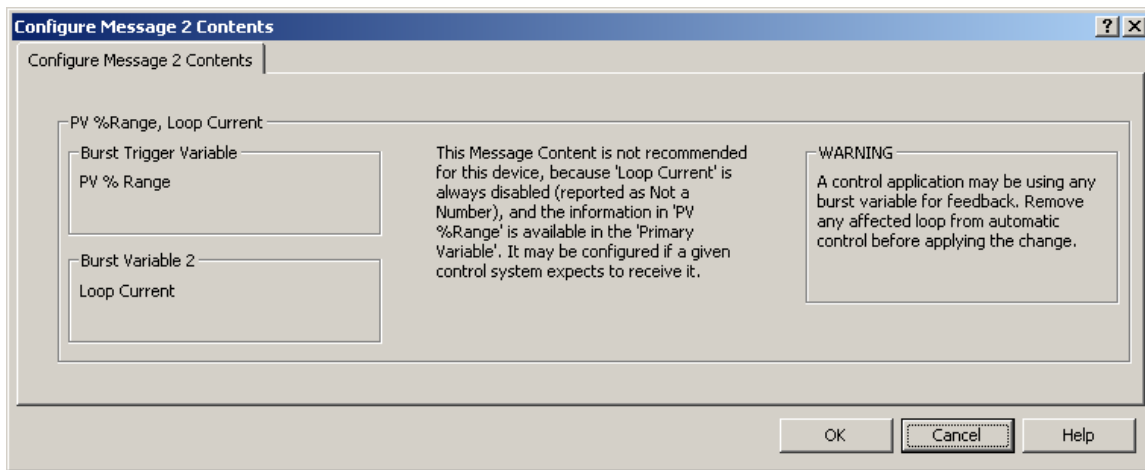
Here you can also edit the 2nd, 3rd, and 4th *Dynamic Variable* slots. The *Trigger Variable* is the Primary Variable in the above two cases.

If there are no slots to configure in the detailed content, the content is simply displayed.

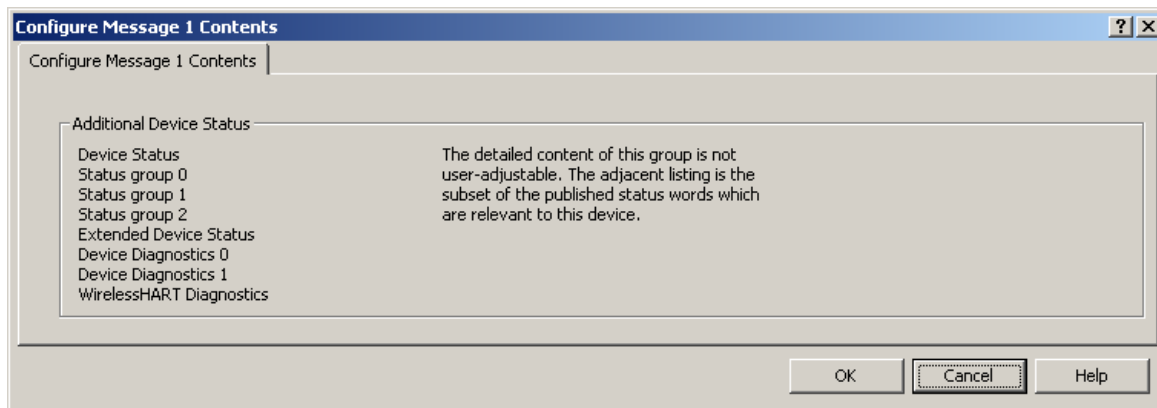
Primary Variable (Command 1):



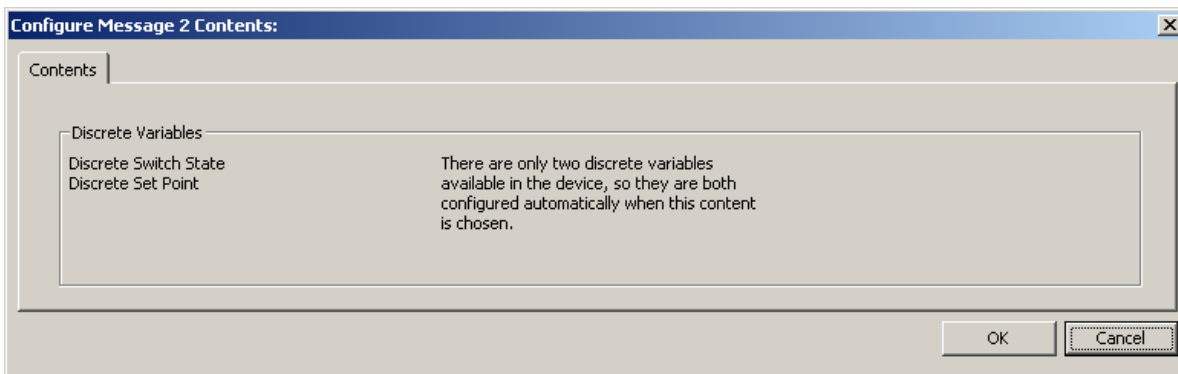
PV % Range, Loop Current (Command 2):



Additional Device Status (Command 48):

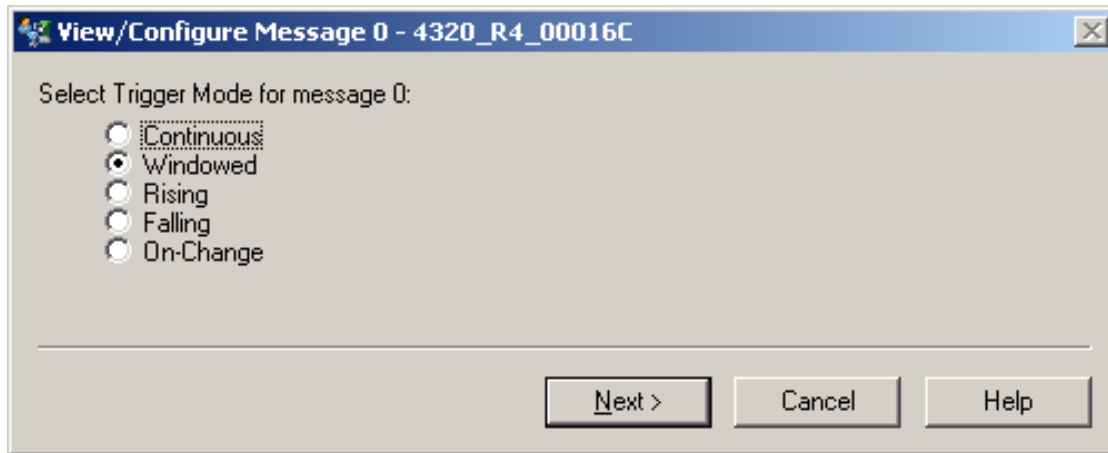


Discrete Variables (Command 64386):

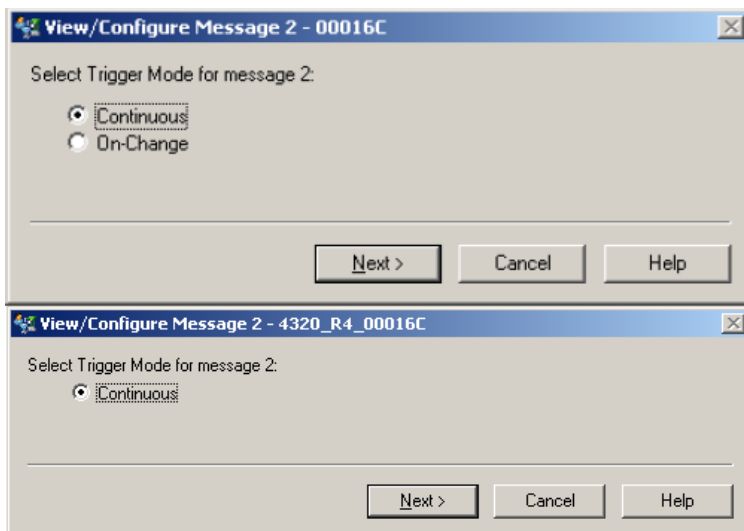


Burst Trigger Mode

You are then asked to select the *Trigger Mode* (*Continuous*, *Windowed*, *Rising*, *Falling*, or *On-Change*). *Continuous* and *Windowed* are used in the majority of applications. The function of each of these modes is discussed below.



Some basic content choices, such as *PV %Range + Loop Current*, *Additional Device Status*, *Emerson Specific*, and *Discrete Variables*, have limited triggering capability. In those cases only the available trigger modes are displayed, e.g.:



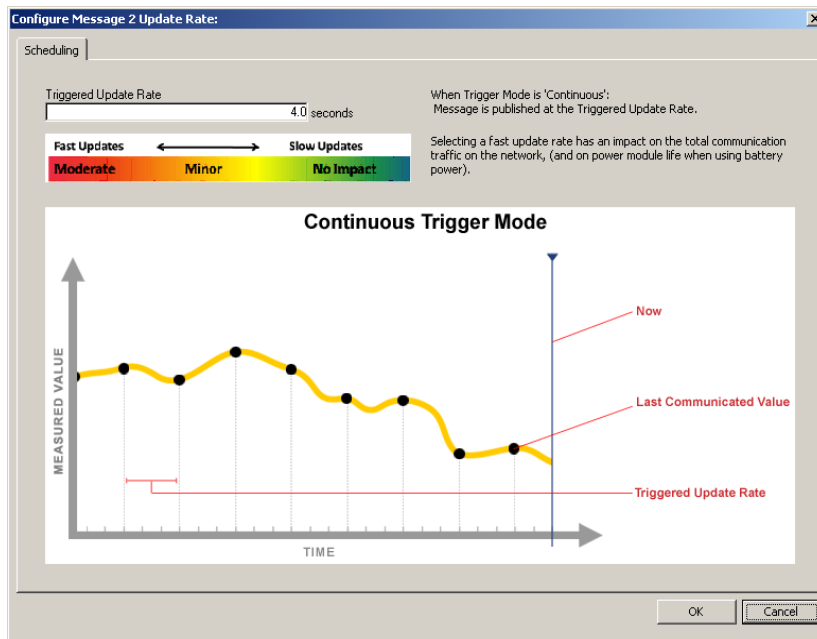
The burst message can be published continuously at a constant rate, or it can be configured for fast publishing when trigger conditions are met, with slower publishing as the default. This is often termed “Report by Exception”. Instead of *Continuous*, choose one of the “triggered” modes: *Windowed*, *Rising*, *Falling*, or *On-Change*.

Trigger Parameters / Scheduling

This menu structure varies based on the *Message Content* and *Trigger Mode* selections.

Update Rates

If you select *Continuous* trigger mode, the only parameter that is adjustable is the *Triggered Update Rate*.



When the selected trigger mode is other than *Continuous*, a *Default Update Rate* is added to the parameters to be configured. The message will be published at the *Default Update Rate* until the trigger condition is met. When the trigger condition has been met, the message will be published at the *Triggered Update Rate* for at least 3 transmissions. Then, if the trigger condition is no longer met, the message will revert to publication at the slower *Default Update Rate*. Note that the legal values of the update rate parameters are somewhat restricted. The longest permitted value is 1 hour (3600 seconds), the shortest usable value may be limited by the Gateway capability and network loading. Values below 60 seconds must be factors of 2: (e.g., 32, 16, 8, 4, 2, or 1).

Sensor Sample Rate and Delayed Triggering

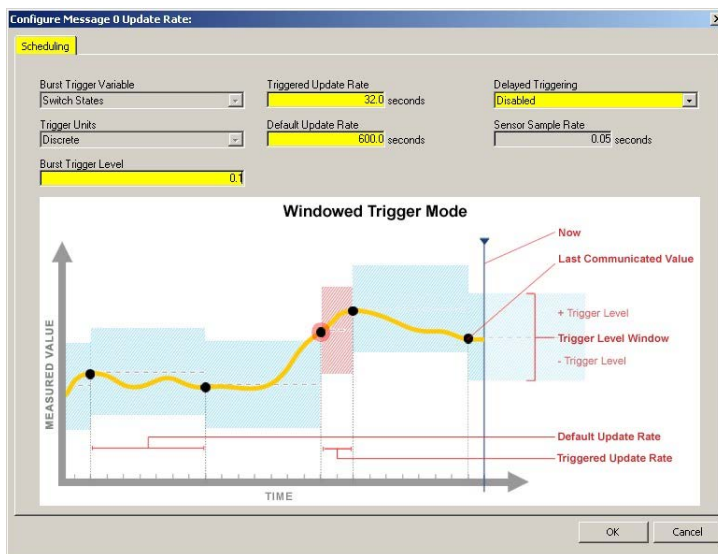
When the trigger mode of any message is other than *Continuous*, the device employs a user-configured *Sensor Sample Rate* for acquiring all of the process-related variables. The value of this variable may be adjusted between 0.5 second and the *Triggered Update Rate* in increments of 0.5 second. (Exception: for External Power devices, the *Sensor Sample Rate* is fixed at the fastest rate possible in the device, since battery life is not a concern.) The edit procedure compares this value against the configured *Triggered Update Rate* of any other enabled burst message whose trigger mode is not *Continuous*, to help prevent setting it slower than the fastest existing rate.

If the *Sensor Sample Rate* is faster than the *Triggered Update Rate*, enabling *Delayed Triggering* allows the device to latch and time-stamp a message as soon as the trigger condition is met, then schedule publishing at the next available *Triggered Update Rate* time slot. This mode is called "Delayed" because the message is published a short time *after* the data was captured. However, it allows capture of a transient event that might have been missed by only checking for changes at the *Triggered Update Rate*.

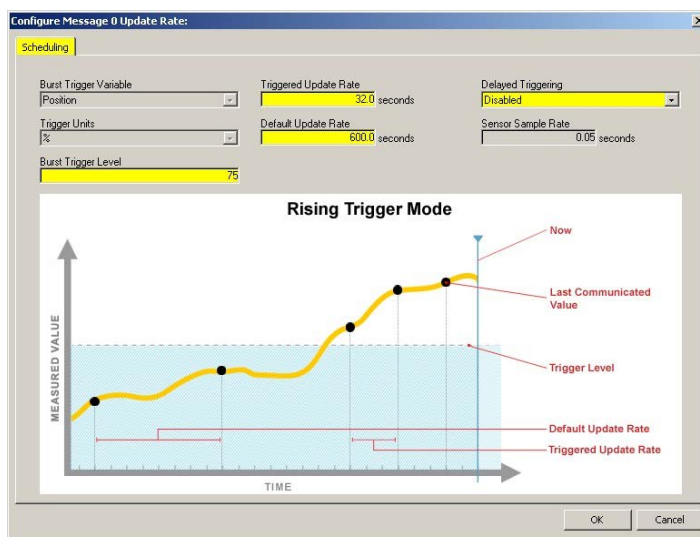
Trigger Level

For *Windowed*, *Rising*, and *Falling* trigger modes, there is also a *Burst Trigger Level* to configure. The procedure now automatically sets *Trigger Class* and *Trigger Units* to the values of the *Burst Trigger Variable*'s Class/Units. Accordingly, the class is no longer displayed. The *Burst Trigger Variable* and *Trigger Units* are presented for reference in setting the *Burst Trigger Level*.

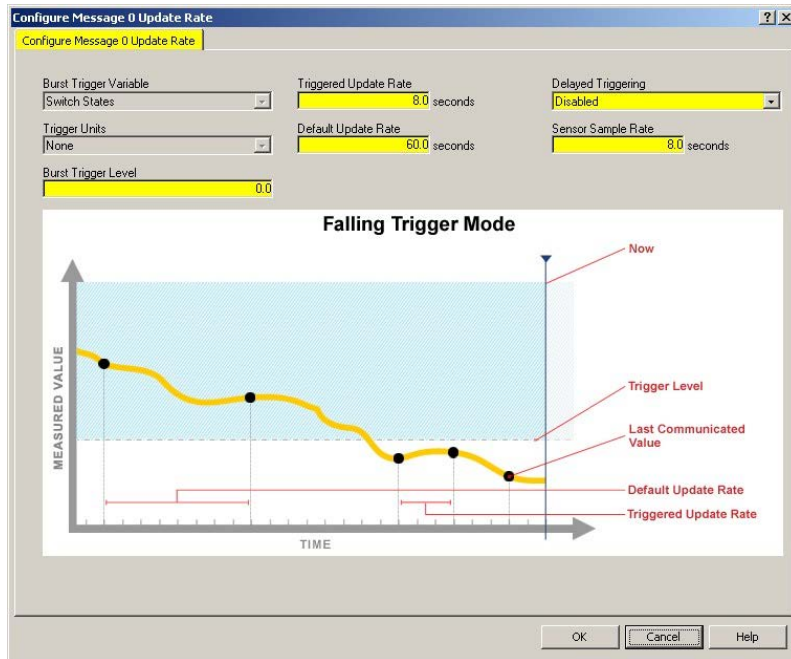
If you select *Windowed* trigger mode, the *Burst Trigger Level* defines a +/- zone around the previous published value of the *Burst Trigger Variable*. This mode is used when steady state operation is expected and increased time-domain resolution is desired only when the process is changing rapidly. Adjust the *Burst Trigger Level* to set how much the *Burst Trigger Variable* must deviate from its previous value to trigger fast publishing.



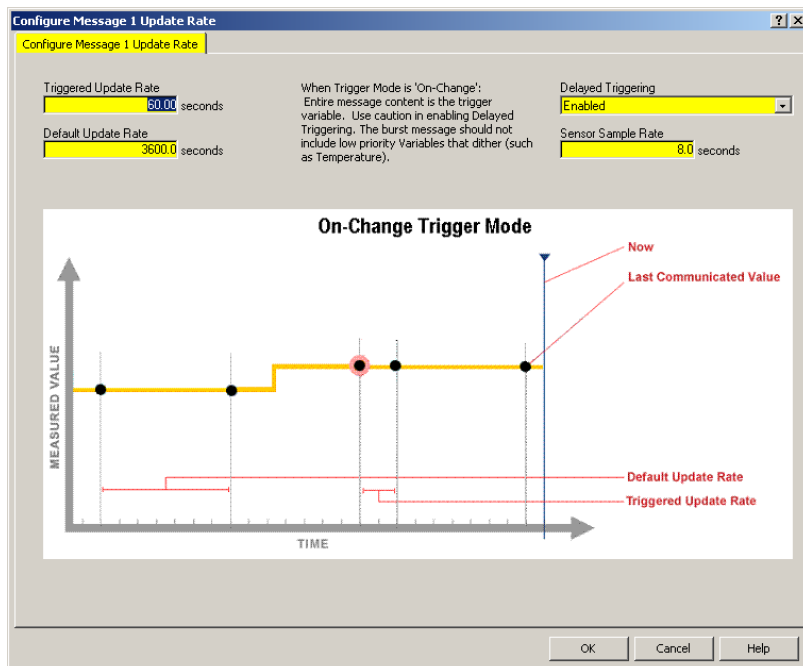
In *Rising* trigger mode, the trigger level defines an upper threshold. This mode is used when process operation below a specified level is of little consequence, but operation above that level needs to be tracked in greater detail. Adjust the *Burst Trigger Level* to define the desired upper threshold that must be exceeded to meet the trigger condition.



In *Falling* trigger mode, the trigger level defines a lower threshold. This mode is used when process operation above a specified level is of little consequence, but operation below that level needs to be tracked in greater detail. Adjust the *Burst Trigger Level* to define the desired lower threshold that must be exceeded to meet the trigger condition.

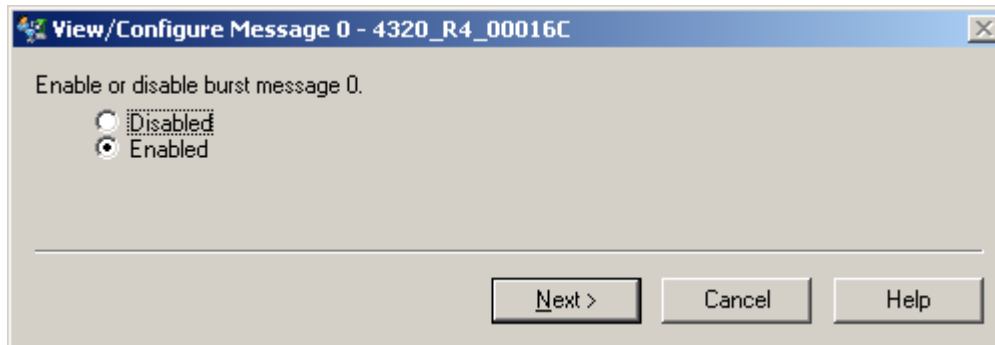


In *On-Change* trigger mode, the entire message is the trigger source, and any deviation from the previous value satisfies the trigger condition. Therefore, the *Burst Trigger Variable*, *Trigger Units* and *Burst Trigger Level* do not appear. This mode is most useful for discrete value message content such as *Additional Device Status* and *Discrete Variables*. It should not be used on messages that contain data that may dither.



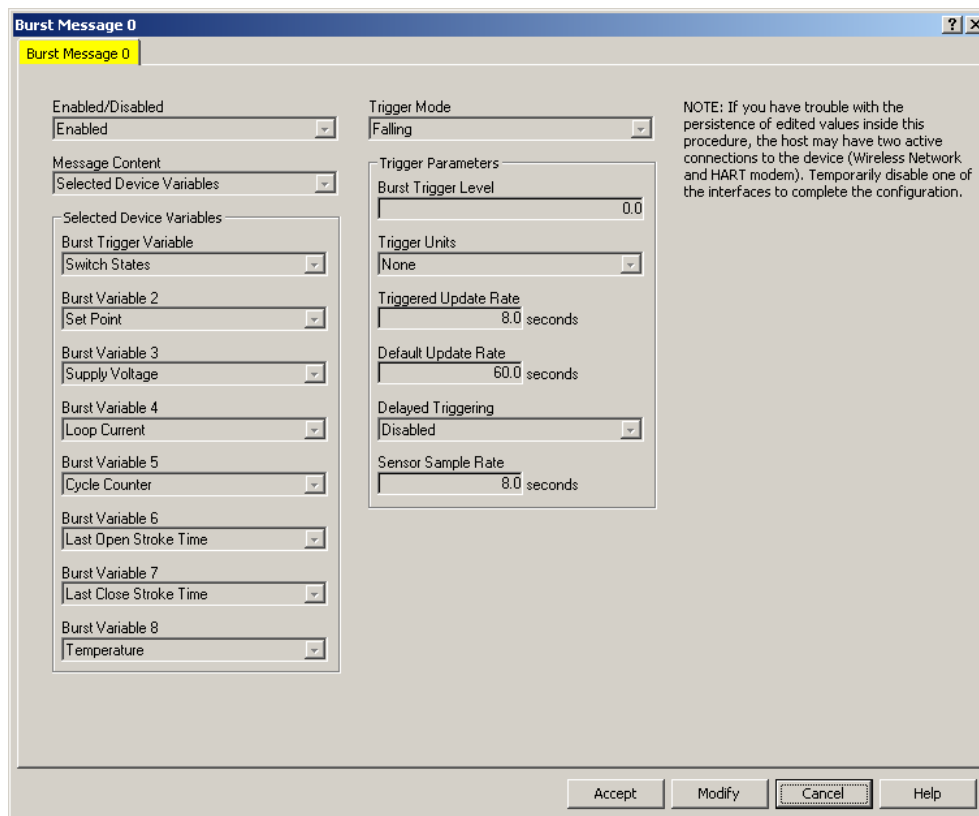
Enabled/Disabled

Select *Enabled* to request network bandwidth allocation for this burst message. Select *Disabled* to terminate publication of this burst message and release bandwidth allocation back to the network.



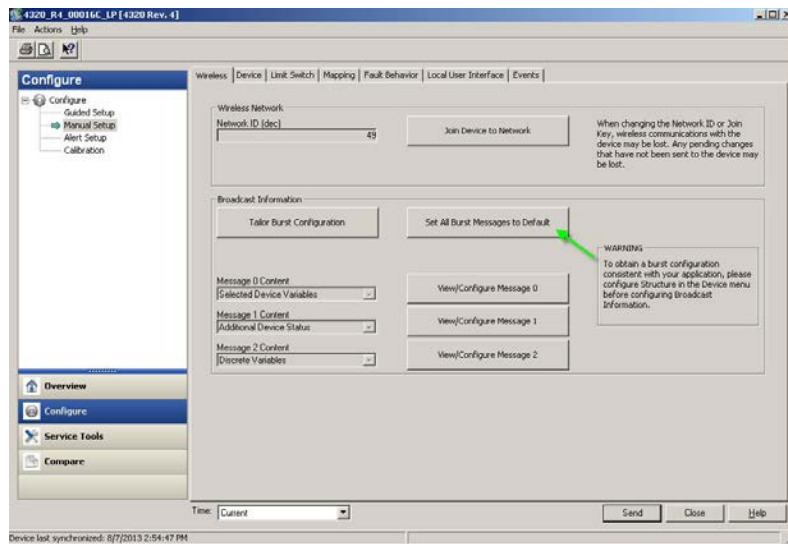
Summary — Accept/Modify

After the editing process is complete, the summary screen of the entire burst configuration with your changes is shown for review. If the configuration meets your approval, click the *Accept* button to send the changes to the device. If you want to make additional changes, click the *Modify* button to loop through the procedure again. If after any pass through the edit loop, you decide that you don't want to make the changes after all, click the *Cancel* button and all pending changes will be discarded.



Set All Burst Messages to Default

For initial configuration, after modifying the device structure, this procedure will establish a reasonable set of burst parameters that will allow normal operation. It can also be useful to recover from any burst configuration experiments that lead to communication problems.



The following tables describe the default settings that result for each structure and device type.

Burst Configuration Details

| Message | Basic Content | Trigger Mode | Device Structure | Message Enabled/Disabled | Triggered Update Rate | Default Update Rate | Delayed Triggering |
|---------|---------------------------|--------------|-----------------------------|--------------------------|-----------------------|---------------------|--------------------|
| 0 | Selected Device Variables | Windowed | Controller w/ Snap Disabled | Enabled | 8 sec | 1 min | Disabled |
| | | | Controller w/ Snap Enabled | Enabled | 16 sec | 1 min | |
| | | | Monitor | Enabled | 4 sec | 1 min | |
| 1 | Additional Status | On Change | X ⁽¹⁾ | Enabled | 1 min | 1 hr | Enabled |
| 2 | Discrete Variables | On Change | Controller w/ Snap Disabled | Enabled | 8 sec | 1 min | Disabled |
| | | | Controller w/ Snap Enabled | Enabled | 1 min | 10 min | |
| | | | Monitor | Disabled | 1 min | 10 min | |

1. X indicates that the Device Structure does not matter.

| Device Structure | Sensor Sample Rate | |
|----------------------------|--------------------|----------------|
| | Battery Power | External Power |
| Controller w/Snap Disabled | 8 sec | 50 msec |
| Controller w/ Snap Enabled | 1 sec | |
| Monitor | 1 sec | |

TopWorx 4310

Detailed Default Burst Contents for Selected Device Variables
and corresponding Dynamic Variable Assignments

| Device Structure | | Controller w/Snap Disabled | Controller w/Snap Enabled | Monitor |
|--------------------------------------|---------------|----------------------------|---------------------------|-------------------|
| Selected Device Variable Assignments | Trigger | Switch States | Switch States | Switch States |
| | Trigger Level | 0.0 | 0.0 | 0.0 |
| | 2 | Set Point | Set Point | Transition Dwell |
| | 3 | Supply voltage | Supply voltage | Supply Voltage |
| | 4 | Loop current | Loop current | Loop current |
| | 5 | Cycle Counter | Cycle Counter | Cycle Counter |
| | 6 | Last Open Stroke | Temperature | Opened/High Dwell |
| | 7 | Last Close Stroke | Time Stamp 0 | Closed/Low Dwell |
| | 8 | Temperature | (Not Used) | Time Stamp 0 |
| Dynamic Variables | PV | Switch States | Switch States | Switch States |
| | 2nd | Set Point | Set Point | Switch States |
| | 3rd | Cycle Counter | Cycle Counter | Cycle Counter |
| | 4th | Supply Voltage | Supply Voltage | Supply Voltage |

The 4320 has additional Device Variables related to Position, so the default slot assignments are different than in the 4310:

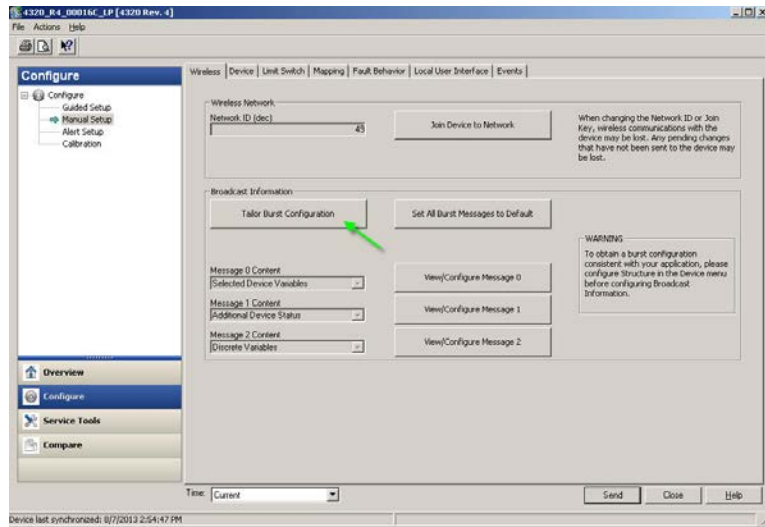
Fisher 4320

Detailed Default Burst Contents for Selected Device Variables
and corresponding Dynamic Variable Assignments

| Device Structure | | Controller w/Snap Disabled | Controller w/Snap Enabled | Monitor |
|--------------------------------------|---------------|----------------------------|---------------------------|-------------------|
| Selected Device Variable Assignments | Trigger | Switch States | Position | Position |
| | Trigger Level | 0.0 | 5.0% | 5.0% |
| | 2 | Set Point | Set Point | Switch States |
| | 3 | Position | Switch States | Supply Voltage |
| | 4 | Supply voltage | Supply voltage | Loop current |
| | 5 | Loop current | Loop current | Cycle Counter |
| | 6 | Cycle Counter | Cycle Counter | Opened/High Dwell |
| | 7 | Last Open Stroke | Temperature | Closed/Low Dwell |
| | 8 | Last Close Stroke | Time Stamp 0 | Time Stamp 0 |
| Dynamic Variables | PV | Position | Position | Position |
| | 2nd | Set Point | Set Point | Switch States |
| | 3rd | Switch States | Switch States | Cycle Counter |
| | 4th | Supply Voltage | Supply Voltage | Supply Voltage |

Tailor Burst Configuration

This procedure will tailor the content and triggering of the 3 burst messages to your device structure and application without requiring you to edit any actual settings. Your responses to a series of questions are used to select one of 14 pre-defined configurations. The cycling and reporting times have the most influence on update and sample rates, and the structure and application have the most influence on the detailed message content.



Tailored Burst Configuration

| Message | Basic Content | Trigger Mode | Device Structure/Application | | Message Enabled /Disabled | Triggered Update Rate | Default Update Rate | Delayed Triggering |
|---------|---------------------------|--------------|------------------------------|--------------------------|---------------------------|-----------------------|---------------------|--------------------|
| 0 | Selected Device Variables | Windowed | Controller w/ Snap Disabled | Slow Cycle | Enabled | 1 min | 10 min | Disabled |
| | | | | Fast Cycle | | 8 sec | 1 min | |
| | | | Controller w/ Snap Enabled | Slow Cycle | | 1 min | 10 min | |
| | | | | Fast Cycle | | 16 sec | 1 min | |
| | | | Monitor | Slow/Slow ⁽¹⁾ | | 1 min | 10 min | Enabled |
| | | | | Slow/Fast ⁽¹⁾ | | 16 sec | 10 min | Disabled |
| | | | | Fast/Fast ⁽¹⁾ | | 4 sec | 1 min | Disabled |
| | | | | Relief Valve | | 4 sec | 1 min | Enabled |
| 1 | Additional Status | On Change | X ⁽²⁾ | X ⁽²⁾ | Enabled | 1 min | 1 hr | Enabled |
| 2 | Discrete Variables | On Change | Controller w/ Snap Disabled | Slow Cycle | Enabled | 1 min | 10 min | Disabled |
| | | | | Fast Cycle | | 8 sec | 1 min | |
| | | | Controller w/ Snap Enabled | X ⁽²⁾ | | 1 min | 10 min | |
| | | | Monitor | X ⁽²⁾ | Disabled | 1 min | 10 min | |

1. "Slow/Slow" etc. means "Slow Cycle, Slow Report", respectively.
2. X indicates that the Device Structure/Application does not matter.

| | | Sensor Sample Rate | |
|--------------------------------|------------------------|--------------------|----------------|
| Device Structure / Application | | Battery Power | External Power |
| Controller w/Snap Disabled | Slow Cycle | 8 sec | 50 msec |
| | Fast Cycle | 1 sec | |
| Controller w/ Snap Enabled | Slow Cycle | 16 sec | |
| | Fast Cycle | 1 sec | |
| Monitor | Slow Cycle/Slow Report | 16 sec | |
| | Slow Cycle/Fast Report | 4 sec | |
| | Fast Cycle/Fast Report | 1 sec | |
| | Relief Valve | 1 sec | |

**Detailed Tailored Burst Contents for Selected Device Variables
and corresponding Dynamic Variable Assignments**

TopWorx 4310

| Device Structure | | Controller | | Monitor | | | |
|--------------------------------------|---------------|-------------------|----------------|--------------------------|--------------------------|-------------------|---------------------------|
| | | Snap Disabled | Snap Enabled | Normally Closed | Relief Valve | General | Normally Opened |
| Selected Device Variable Assignments | Trigger | Switch States | Switch States | Closed/Low Limit Tripped | Closed/Low Limit Tripped | Switch States | Opened/High Limit Tripped |
| | Trigger Level | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2 | Set Point | Set Point | Switch States | Switch States | Transition Dwell | Switch States |
| | 3 | Supply voltage | Supply voltage | Supply voltage | Supply Voltage | Supply Voltage | Supply Voltage |
| | 4 | Loop current | Loop current | Loop current | Loop current | Loop current | Loop Current |
| | 5 | Cycle Counter | Cycle Counter | Cycle Counter | Cycle Counter | Cycle Counter | Cycle Counter |
| | 6 | Last Open Stroke | Temperature | Opened/High Dwell | Opened/High Dwell | Opened/High Dwell | Opened/High Dwell |
| | 7 | Last Close Stroke | Time Stamp 0 | Closed/Low Dwell | Closed/Low Dwell | Closed/Low Dwell | Closed/Low Dwell |
| | 8 | Temperature | (Not Used) | Time Stamp 0 | Time Stamp 0 | Time Stamp 0 | Time Stamp 0 |
| Dynamic Variables | PV | Switch States | Switch States | Switch States | Switch States | Switch States | Switch States |
| | 2nd | Set Point | Set Point | Closed/Low Limit Tripped | Closed/Low Limit Tripped | Switch States | Opened/High Limit Tripped |
| | 3rd | Cycle Counter | Cycle Counter | Cycle Counter | Opened/High Dwell | Cycle Counter | Cycle Counter |
| | 4th | Supply Voltage | Supply Voltage | Supply Voltage | Supply Voltage | Supply Voltage | Supply Voltage |

**Detailed Tailored Burst Contents for Selected Device Variables
and corresponding Dynamic Variable Assignments**

Fisher 4320

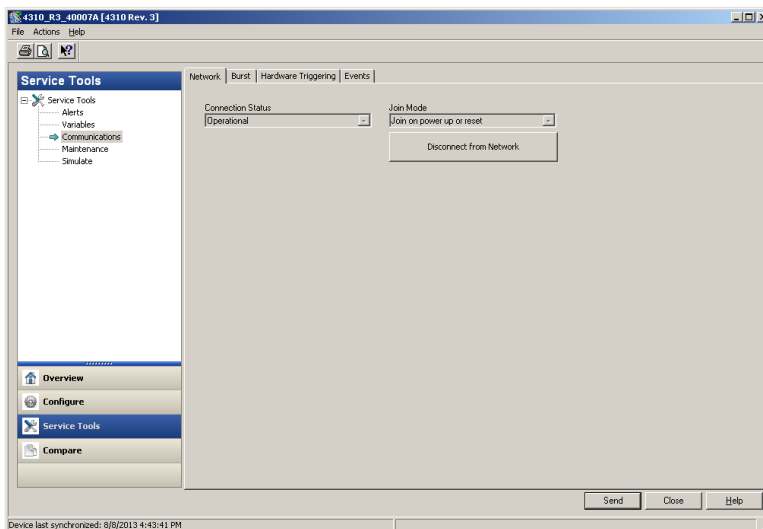
| Device Structure | | Controller | | Monitor | | | |
|--------------------------------------|---------------|-------------------|----------------|--------------------------|--------------------------|-------------------|---------------------------|
| | | Snap Disabled | Snap Enabled | Normally Closed | Relief Valve | General | Normally Opened |
| Selected Device Variable Assignments | Trigger | Switch States | Position | Closed/Low Limit Tripped | Closed/Low Limit Tripped | Position | Opened/High Limit Tripped |
| | Trigger Level | 0.0 | 5.0% | 0.0 | 0.0 | 5.0% | 0.0 |
| | 2 | Set Point | Set Point | Switch States | Switch States | Switch States | Switch States |
| | 3 | Position | Switch States | Position | Position | Supply Voltage | Position |
| | 4 | Supply voltage | Supply voltage | Supply Voltage | Supply Voltage | Loop current | Supply Voltage |
| | 5 | Loop current | Loop current | Loop Current | Loop Current | Cycle Counter | Loop Current |
| | 6 | Cycle Counter | Cycle Counter | Cycle Counter | Cycle Counter | Opened/High Dwell | Cycle Counter |
| | 7 | Last Open Stroke | Temperature | Opened/High Dwell | Opened/High Dwell | Closed/Low Dwell | Closed/Low Dwell |
| | 8 | Last Close Stroke | Time Stamp 0 | Time Stamp 0 | Time Stamp 0 | Time Stamp 0 | Time Stamp 0 |
| Dynamic Variables | PV | Position | Position | Position | Position | Position | Position |
| | 2nd | Set Point | Set Point | Switch States | Closed/Low Limit Tripped | Switch States | Switch States |
| | 3rd | Switch States | Switch States | Cycle Counter | Opened/High Dwell | Cycle Counter | Cycle Counter |
| | 4th | Supply Voltage | Supply Voltage | Supply Voltage | Supply Voltage | Supply Voltage | Supply Voltage |

Communication Diagnostics

The *Communications* diagnostics menu item in the *Service Tools* menu contains *Network*, *Burst*, *Hardware Triggering*, and *Events* diagnostics.

Network

The *Network* tab shows the current *Connection Status* and *Join Mode*.

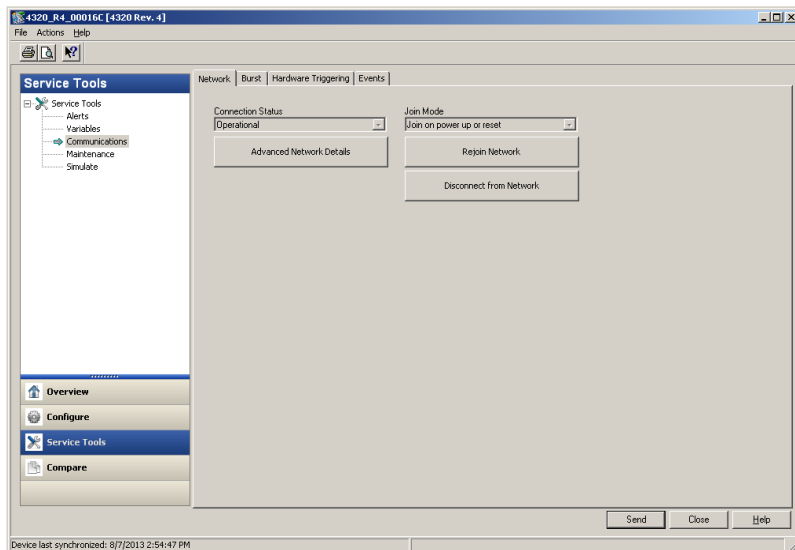


Connection Status echoes the simplified 'CONN' status variable that appears in the device Local User Interface. It can take on the following states: Init, Idle, Disconnected, Searching, Connected, and Operational.

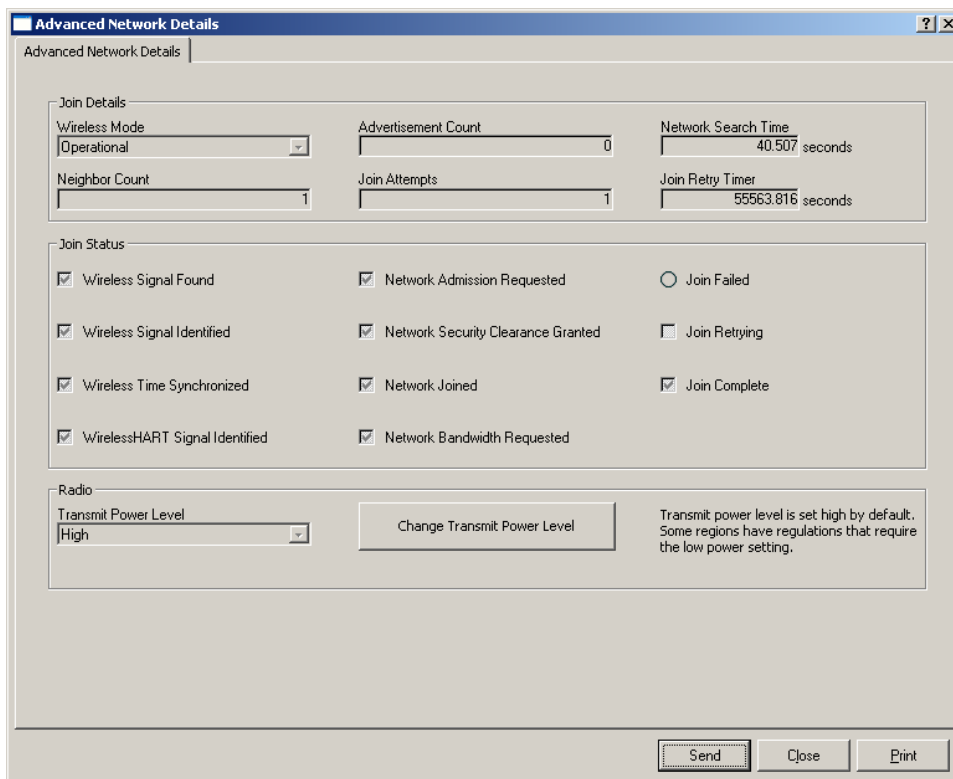
The *Join Mode* reports the condition under which the device will automatically try to join the network whose credentials are stored in its configuration. This parameter is not user-adjustable,

The *Disconnect* procedure allows you to remove the device from the network if you are doing maintenance that would interfere with network operation, or are retiring or re-commissioning the device for some other application.

If you are connected to the device at the Maintenance Port, additional menu items are available. The information in *Advanced Network Details* might be difficult to obtain from the Gateway if you were actually having communications problems, and would add additional network traffic as well. The *Rejoin Network* procedure will only work when you are connected to the device at the Maintenance Port.



Advance Network Details displays technical information useful in troubleshooting communications problems.



The *Join Details* group shows:

Wireless Mode - This is the full state of the wireless connection as defined in the HCF (HART® Communication Foundation) specifications.

- Idle - The device is inactive and has no knowledge of the wireless network. Its wireless transceiver is not active.
- Active Search - The device is listening for network traffic, synchronizing to the network clock, and identifying neighbors.
- Negotiating - The device is presenting its credentials to the network manager and requesting a session key and network key.
- Quarantined - The device has been integrated into the network and has been assigned normal super-frames and links, but does not yet have a Gateway session. It may not forward data packets, only originate or receive them.
- Operational - The device has obtained a Gateway session and is being assigned bandwidth and communication resources.
- Suspended - The device is inactive. All of its network tables are intact.
- Deep Sleep - The device is in an ultra-low power state, scheduled to wake up and re-enter Active Search after a long interval.

Neighbor Count - This indicates the number of neighbors recognized by the instrument on the wireless network.

Advertisement Count - This indicates the number of Advertisement packets received.

Join Attempts - This indicates the number of Join Attempts. (Too many join attempts will result in the device considering the join failed.)

Network Search Time - This indicates the amount of time spent listening for the first advertisement.

Join Retry Timer - This indicates the amount of time since the last join request was sent. It does not freeze after the join is completed, but keeps incrementing.

Note

Some versions of AMS will display this as a negative number if the most significant bit is set, even though it is an unsigned integer. For display, the value has to be rescaled to seconds from its native scaling of 1/32 of a millisecond per bit, and the misinterpretation probably occurs during the scaling process.

Join Status — This indicates device progress in joining the network.

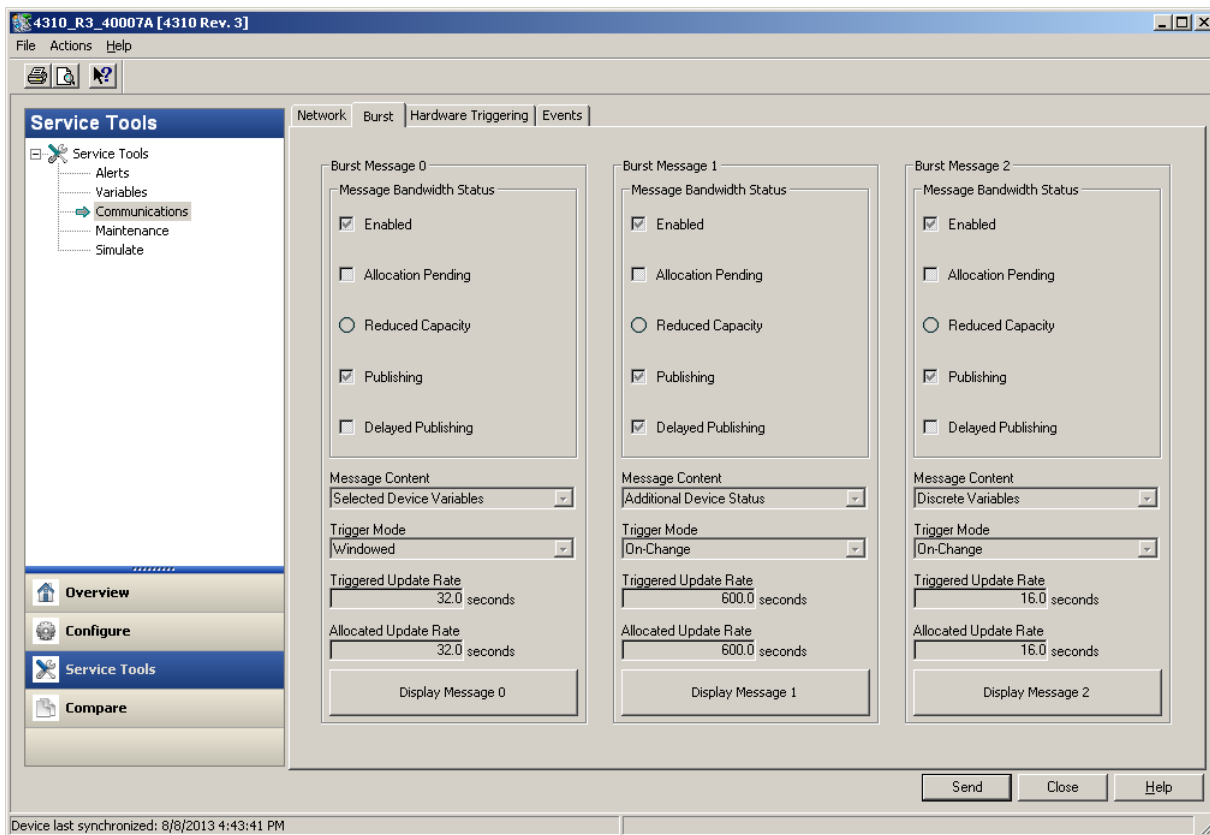
- Wireless Signal Found - Network packets have been recognized.
- Wireless Signal Identified
- *WirelessHART*® Signal Identified
- Wireless Time Synchronized - Device clock has been aligned with host or gateway.
- Network Admission Requested - A join request has been transmitted.
- Join Retrying - The number of join requests issued is greater than 2. This state will be cleared when the device is authenticated or when 'Active Search' mode restarts on wake up from 'Deep Sleep'.
- Join Failed - The join mode has switched from 'Active Search' to 'Deep Sleep'. The device will wake up later and try again. (Join Failed is a degraded condition and all the other bits in Join Status are positive in nature. The Join Failed bit was accordingly given a 'red-bulb' treatment.)

- *Network Security Clearance Granted* - A Network Manager session has been established.
- *Network Joined* - Negotiating Network Properties. Gateway session obtained.
- *Join Complete* - Device is enrolled in the network and in normal operating mode.

The *Radio* group displays the configured *Transmit Power Level* and provides a procedure for changing it if required.

BURST

The *Burst* tab shows diagnostics for each burst message:



The message Bandwidth Status shows:

- whether a given message is enabled in the device
- whether it is still waiting for bandwidth allocation from the network for its requested update rate
- whether it has been assigned bandwidth but at a lower rate than requested
- whether it is actively publishing
- whether it is in Delayed Publishing mode (Using Delayed Trigger mechanism)

The configured *Message Content*, *Trigger Mode*, (requested) *Triggered Update Rate* and the *Triggered Update Rate* that has been *allocated* for the device by the network are displayed below the *Bandwidth Status*.

¶ When the message is enabled, a button will allow you to view a snapshot of the values that would be published in the message, based on the current device states. This feature was originally developed for checking the behavior of

the burst configuration while connected at the maintenance port, since the actual publication of the messages is not supported over that interface. Example snapshots of 3 common burst messages are shown below. Help strings are available for each of the menu items.

The screenshot shows a software window titled "Published Values" with a standard Windows-style title bar (minimize, maximize, close buttons). Inside the window, there is a tab labeled "Published Values". Below the tab, there is a "Burst Message" label and a text area containing a snapshot of data. To the right of the text area, a note states: "This is a snapshot of the data being published in the burst message." Below this, there is a section titled "Extended Device Status" with three radio buttons: "Maintenance Required", "Device Variable Alert", and "Power Critically Low". The "Device Variable Alert" option is selected. Below this section, there is a table of data fields with their current values and dropdown menus for selection.

| Field | Value | Dropdown 1 | Dropdown 2 |
|------------------------|-------------|------------|-------------|
| Switch States | 1 State | Good | Not Limited |
| Set Point | 1 State | Good | Not Limited |
| Supply Voltage | 8.7 Volts | Good | Not Limited |
| Loop Current | NaN mA | Bad | Constant |
| Cycle Counter | 15 Cycles | Good | Not Limited |
| Last Open Stroke Time | 2.8 seconds | Good | Not Limited |
| Last Close Stroke Time | 3.0 seconds | Good | Not Limited |
| Temperature | 19 deg C | Good | Not Limited |

At the bottom of the window, there are three buttons: "OK", "Cancel", and "Help".

The image displays two screenshots of a software window titled "Status". The window has a blue title bar and a yellow "Status" tab. The main content area is divided into three columns of radio button alerts. The top screenshot shows the first three columns: Failure Alerts, Maintenance Alerts, and Advisory Alerts. The bottom screenshot shows the continuation of the list, including Position Sensor High Limit Exceeded, Opened/High Limit Tripped, Transition Dwell Alert, Valve Movement Fail, Low Supply Voltage Warning, Environmental Limit, Non-PV Out of Limits, Temperature Too High, Local User Interface Disabled, Temperature Too Low, Burst Capacity Denied, Bandwidth Allocation Pending, and Event Log Overflow. Each alert is preceded by an unselected radio button. The window includes "OK" and "Cancel" buttons at the bottom right.

Status

Status

Burst Message: 1

This is a snapshot of the data being published in the burst message.

Failure Alerts

- ☐ Device Malfunction
- ☐ Sensor Module Error
- ☐ Electronics Failure
- ☐ Non-Volatile Memory Failure
- ☐ Radio Failure

Maintenance Alerts

- ☐ Power Critically Low
- ☐ Not Calibrated
- ☐ Maintenance Required
- ☐ Cycle Count Alert
- ☐ Close Stroke Time Alert
- ☐ Open Stroke Time Alert
- ☐ Valve Drift
- ☐ Device Variable Alert
- ☐ PV Out of Limits
- ☐ Position Sensor Low Limit Exceeded

Advisory Alerts

- ☐ More Status Available
- ☐ Output in Fault State
- ☐ Device Not In Service
- ☐ Configuration Changed
- ☐ Device Configuration Locked
- ☐ Device Variable Simulation Active
- ☐ Status Simulation Active
- ☐ Discrete Variable Simulation Active
- ☐ Switch Latched
- ☐ Closed/Low Limit Tripped

OK Cancel

Status

Status

☐ Position Sensor High Limit Exceeded

☐ Opened/High Limit Tripped

☐ Transition Dwell Alert

☐ Valve Movement Fail

☐ Low Supply Voltage Warning

☐ Environmental Limit

☐ Non-PV Out of Limits

☐ Temperature Too High

☐ Local User Interface Disabled

☐ Temperature Too Low

☐ Burst Capacity Denied

☐ Bandwidth Allocation Pending

☐ Event Log Overflow

OK Cancel

Published Values

Published Values

Burst Message

Discrete Set Point

Discrete Set Point Data Quality

Discrete Switch State

Discrete Switch State Data Quality

This is a snapshot of the data being published in the burst message.

Specific Status

☐ In Fault State
 ☐ Simulated or Overridden

Specific Status

☐ In Fault State
 ☐ Simulated or Overridden

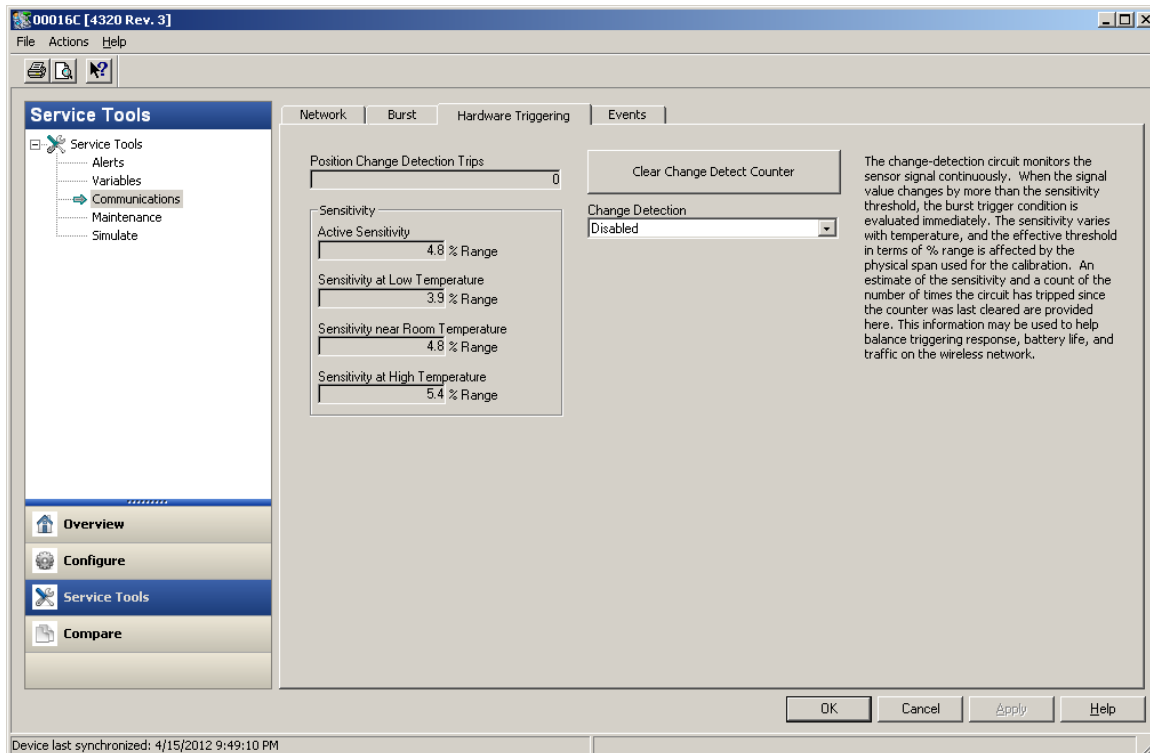
OK

Cancel

Help

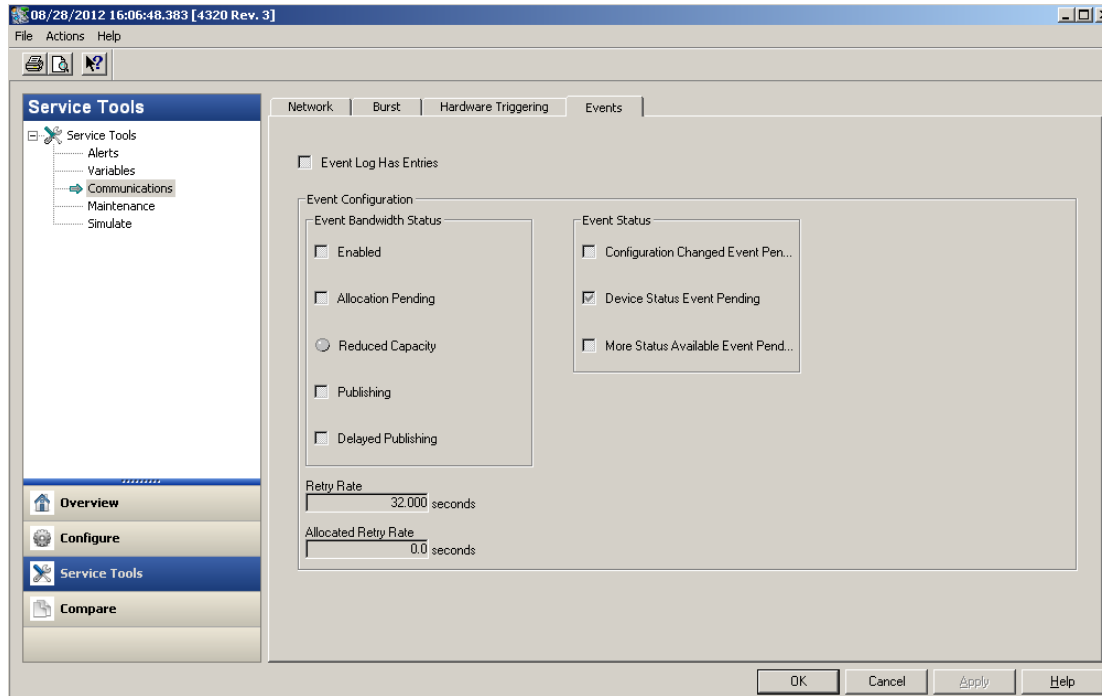
Hardware Triggering

The device has a hardware mechanism that can wake up the processor to evaluate triggering thresholds early if a comparator detects a change in the input sensor signal. This menu displays the Change-Detection thresholds versus temperature, provides a reset procedure for the Change Detect counter, and allows the Change Detection circuit to be enabled or disabled. It is available only in battery-powered devices, since devices with the external power option always sample on a 50 millisecond period, and thus don't need this feature.



Events

Although the Event Notification mechanism may not be enabled from the DD interface a menu has been provided to review the states of the Event Notification system.



This menu displays the state of the event notification system for troubleshooting purposes. A button that lets you read and/or clear the event log appears when the event log has entries.

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